CARPENTRY II

COURSE DESCRIPTION

***Carpentry II* is a course in which students will extend their skills and knowledge related to residential and commercial carpentry. Topics covered include stairs, installation and trim of windows and doors, installation and repair of gypsum wallboard, advanced site layout, exterior finish work, thermal and moisture protection, and an introduction to welding. This course gives students a substantial skill and knowledge foundation typically required for apprentice carpenters.**

Prerequisite(s):	Carpentry I, Algebra I or Math for Technology II Geometry, Principles of Technology I or Physical Science (may be concurrent)
Recommended Credits:	2
Recommended Grade Level(s):	12^{th}

CARPENTRY II STANDARDS

1.0 Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

2.0 Students will assume responsibility for the safety of themselves, their coworkers, and bystanders.

3.0 Students will interpret, layout, and fabricate in conformance to construction drawings and written specifications.

4.0 Students will install windows and doors in residential and commercial structures.

5.0 Students will explore the geometry and methods of fabrication of stairs.

6.0 Students will install, finish, and repair gypsum wallboard.

7.0 Students will install trim on doors, windows, and other features.

8.0 Students will perform site layouts with radial measurements.

9.0 Students will complete exterior finish work on residential and commercial structures.

10.0 Students will describe the need for and methods of achieving thermal and moisture protection.

11.0 Students will perform basic oxyfuel cutting and shielded metal arc welding on carbon steel.

CARPENTRY II

STANDARD 1.0

Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

LEARNING EXPECTATIONS

The student will:

1.1 Demonstrate leadership skills.
1.2 Use problem-solving techniques to address and propose solutions to school, community, and workplace problems.
1.3 Demonstrate the ability to work professionally with others.
1.4 Participate in SkillsUSA-VICA as an integral part of instruction.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

1.1.A Exhibits integrity and pride in performance.
1.1.B Keeps group work focused on task.
1.2.A Determines the root causes of observed conflicts or problems.
1.2.B Mediates disputes between parties.
1.3.A Participates in a job shadowing experience.
1.3.B Assembles a student team to solve an assigned problem.
1.4.A Attends and participates in periodic meetings of SkillsUSA-VICA or similar organization.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Prepare a resume.
- Participate in various SkillsUSA-VICA or similar programs and/or competitive events.
- Attend a professional organization meeting such as, local Chamber of Commerce meeting.
- Participate in the American Spirit Award competition with SkillsUSA-VICA.
- Participate in job shadowing or internship program with local business or industry.
- Take an active role in a group project assigned by the instructor.
- Identify and detail a problem area in the school, community, or workplace and propose solutions. If possible, and with appropriate approvals, implement or facilitate the solution.

INTEGRATION LINKAGES

SkillsUSA-VICA, *Professional Development Program,* SkillsUSA-VICA, Communications and Writing Skills, Teambuilding Skills, Research, Language Arts, Sociology, Psychology, Math, Applied Communication, Social Studies, Problem Solving, Interpersonal Skills, Employability Skills, Critical-Thinking Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Chamber of Commerce, Colleges, Universities, Technology Centers, and Employment Agencies

CARPENTRY II

STANDARD 2.0

Students will assume responsibility for the safety of themselves, their coworkers, and bystanders.

LEARNING EXPECTATIONS

The student will:

2.1 Exhibit and encourage in others a positive attitude regarding safety practices and issues.
2.2 Habitually inspect and use appropriate personal protective equipment for assigned tasks.
2.3 Inspect, maintain, and employ safe operating procedures with tools and equipment, such as scaffolding, lifting equipment, and air-powered drivers.
2.4 Exhibit a well-developed awareness of potential hazards to self and others.
2.5 Carry out responsibilities under HazCom (Hazard Communication) regulations.
2.6 Take action to protect coworkers and bystanders from hazards as required by regulations and company policies.
2.7 Report accidents and observed hazards and execute emergency response procedures as required by regulations and company policies.
2.8 Demonstrate appropriate construction-related safety procedures.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

2.1.A Includes safety procedures in activity plans.
2.1.B Exhibits an awareness of proper safety procedures by coworkers.
2.1.C Responds positively to instruction, advice, and correction regarding safety issues.
2.1.D Reports to school or work physically ready to perform to professional standards, such as, rested or not impaired by medications, drugs, alcohol, and so forth.
2.2.A Selects, inspects, and uses the correct personal protective equipment for the assigned task.
2.3.A Checks scafolding for stability, bracing, walk boards, and guard rails prior to use.
2.3.B Inspects extension cords for the presence of a functional ground connection, prior to use.
2.4.A Is observant of personnel and activities in the vicinity of the work area.
2.4.B Warns nearby personnel, prior to starting potentially hazardous actions.
2.5.A Applies information from material safety data sheet (MSDS) to protect self and others from the health hazards associated with assigned tasks.
2.5.B Reports hazards found on the job site to the supervisor and remedies the hazard as instructed.
2.6.A Warns and protects workers and bystanders of overhead loads in transit.
2.6.B Provides and activates adequate ventilation equipment as required by the task.
2.7.A Reports all injuries and observed unguarded hazards to the immediate supervisor.
2.7.B Executes assigned tasks as described in emergency response procedures.
2.8.A Passes with 100 % accuracy a written examination relating to safety issues.
2.8.B Passes with 100% accuracy a performance examination relating to safety.
2.8.C Maintains a portfolio record of written safety examinations and equipment examinations for which the student has passed an operational checkout by the instructor.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Prior to assigning a task using power tools, the instructor removes some required safety items and instructs students to perform an inspection of tools.
- Instruct a visitor to obviously approach the vicinity of a student conducting a hazardous activity and note the level of awareness demonstrated by the student.
- In a project requiring solvents or adhesives, introduce a new brand or type and require students to retrieve the MSDS and identify possible health hazards.

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, Secretary's Commission on Achieving Necessary Skills (SCANS), SkillsUSA-VICA, Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency, United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

STANDARD 3.0

Students will interpret, lay out, and fabricate in conformance to construction drawings and written specifications.

LEARNING EXPECTATIONS

The student will:

3.1 Scale dimensions that are not explicitly included in construction drawings.
3.2 Interpret plan and elevation views shown in construction drawings.
3.3 Recognize and interpret lines and symbols commonly used in construction drawings.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

3.1.A Uses the scale of a drawing to determine locations not explicitly dimensioned.
3.1.B Uses the scale of a drawing to determine dimensions not explicitly shown on drawing.
3.2.A Interprets three-dimensional features found in construction drawings.
3.3.A Readily relates symbols and details of electrical and plumbing elements that effect or could be affected by framing decisions.
3.3.B Readily relates structural framing components and joints with symbols and framing details in construction drawings.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Given a set of plans and specifications for a residential or commercial structure, make a complete material take-off of cabinetry
- Given a set of plans and specifications for a residential or commercial structure, determine the location of cabinetry not explicitly dimensioned.
- Construct batter boards and lay out a foundation plan based on a construction drawing, including grade stakes, locations of concrete forms, and plumbing and electrical stub-ups, e.g., using stakes, hammers, steel tapes, and builder's levels.
- Given a set of plans and specifications for a residential or commercial structure, make a complete take-off for the framing material.
- Given a set of plans and specifications for a residential or commercial structure, determine the location of elements not explicitly dimensioned.
- Determine the detail of a stair structure or roof structure shown in construction drawings.

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, Secretary's Commission on Achieving Necessary Skills (SCANS), SkillsUSA-VICA, Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency, United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

STANDARD 4.0

Students will install windows and doors in residential and commercial structures.

LEARNING EXPECTATIONS

The student will:

4.1 Compare and contrast various types of windows and doors used in residential and commercial structures.
4.2 Comprehend and interpret fire rating information on the door schedule included in construction plans.
4.3 Install interior and exterior pre-hung doors, with weather-stripping and locksets where applicable.
4.4 Install pre-hung windows.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

4.1.A Compares effectiveness of various techniques used to make energy efficient windows.
4.1.B Classifies windows as single- or double-hung, casement, hopper, awning, or fixed.
4.1.C Contrasts various types of door constructions, for both exterior and interior use, including stile-and-rail doors, hollow core, solid core, and fire rated doors.
4.1.D Compares and contrasts sliding, folding, and pocket doors.
4.2.A Identifies locations requiring fire-rated doors of various classes in a commercial project by examination of construction drawings.
4.2.B Selects the correct door label (A, B, C, D, E) for a door opening based upon the door location, wall structure, and spaces on either side of the door.
4.3.A Installs a pre-hung interior or exterior door, given a framed wall with door opening.
4.3.B Completes the exterior door installation by the addition of weather stripping and locksets.
4.4.A Installs a pre-hung window, given a framed wall with window opening.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Create a report based on Internet or trade-journal research for various types of high-efficiency windows.
- Examine construction drawings and speculate need for labeled openings and corresponding fire-rated doors, and compare to the accompanying door schedule.
- Construct a complete pre-hung wood panel door assembly and prepare for shipment to a building site. (Alternate: sell or auction finished door.)
- Install a student-built (not your own) pre-hung door in a framed wall opening.
- Construct a complete pre-hung window assembly and prepare for shipment to a building site. (Alternate: sell or auction finished window.)

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, SCANS, SkillsUSA-VICA,

Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), Occupational Safety and Health Administration (OSHA), United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

STANDARD 5.0

Students will explore the geometry and methods of fabrication of stairs.

LEARNING EXPECTATIONS

The student will:

5.1 Compare and contrast various types of stair construction used in residential and commercial structures.
5.2 Determine unit rise and unit run, and compare to appropriate building code standards.
5.3 Interpret construction drawings of stairs.
5.4 Construct all or part of a stair, based on construction drawings.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

5.1.A Compares features and benefits of stairs made of wood, poured-in-place concrete, steel frame with concrete treads, etc.
5.2.A Calculates the unit rise and unit run, and ensures conformance with appropriate building code standards, given a specified rise and run for a straight-run stair.
5.2.B Calculates the unit rise and unit run, and ensures conformance with appropriate building code standards, given a specified rise and run for a narrow-u stair and landing.
5.3.A Makes a material take-off for a stairway structure, based on construction drawings.
5.3.B Makes a list of the attachment and anchoring details for a stairway structure.
5.4.A Makes a material take-off for a specified stairway structure, based on construction drawings.
5.4.B Makes a layout, fabricates all components, and completes the assembly of a specified stairway structure.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Visit and write a report about a manufacturer of stair components and assemblies.
- Given a physical location for adding a stairway to an existing structure, determine the optimum stair shape, unit rise and unit run, and dimensions of any required landings, banisters, or railings to satisfy local building codes and customer demands.
- Complete a material take-off for a stair installation (not a cast-in-place concrete stair) in a commercial building, given a construction drawing.
- Complete the layout, parts fabrication, and assembly for a three-step wood-frame stair, given shop drawings.

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, SCANS, SkillsUSA-VICA, Associated Builders and Contractors (ABC), Associated General Contractors (AGC), NCCER, Occupational Safety and Health Administration (OSHA), Environmental Protection Agency,

United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

STANDARD 6.0

Students will install, finish, and repair gypsum wallboard.

LEARNING EXPECTATIONS

The student will:

6.1 Compare and contrast the various types and uses of gypsum wallboard.
6.2 Installs gypsum wallboard using proper fasteners
6.3 Finish a gypsum wallboard installation.
6.4 Repair a damaged gypsum wallboard.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

6.1.A Selects use and location of gypsum wallboard with appropriate types.
6.1.B Describes how gypsum wallboard is employed to achieve fire-rated walls, and other applications, such as backing for plaster and tile installation, acoustic barrier, and a barrier for vapor and radiant-heat.
6.2.A Cuts, fits, and installs gypsum wallboard onto a framed wall.
6.2.B Selects and uses appropriate fastener and materials for a given gypsum-wallboard application.
6.3.A Finishes and textures a gypsum wallboard installation.
6.4.A Assesses extent of damage to gypsum wallboard, choosing appropriate repair method.
6.4.B Executes recommended repair method to damaged gypsum wallboard.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Conduct research and write a report explaining all the requirements for constructing a fire-rated wall using gypsum panels.
- Given a small, but complex framed structure, cut, fit, and fasten gypsum wall board.
- Given the small structure above, finish and texture the gypsum wallboard installation.
- Assess the completed project above, and correct any problems. If no problems exist, knock a hole in it and repair it.

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, Secretary's Commission on Achieving Necessary Skills (SCANS), SkillsUSA-VICA, Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency, United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

STANDARD 7.0

Students will install trim on doors, windows, and other features.

LEARNING EXPECTATIONS

The student will:

7.1 Differentiates between common types of molding and their typical uses.
7.2 Install trim on doors, windows, and other features.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

7.1.A Selects one or more appropriate types of molding to achieve the desired aesthetic effects, given a location requiring molding.
7.2.A Cuts, fits, and secures the molding to the door or window.
7.2.B Cuts, fits, and secures baseboards and other decorative features.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Trim the doors and windows installed in a previous project.
- In connection with previous projects, install baseboards, crown, or other trim features.

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, Secretary's Commission on Achieving Necessary Skills (SCANS), SkillsUSA-VICA, Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency, United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

STANDARD 8.0

Students will perform site layouts with radial measurements.

LEARNING EXPECTATIONS

The student will:

8.1 Make site plan layouts using distance and radial measurement techniques.
8.2 Measure and lay out elevations and grades.
8.3 Measure vertical and horizontal angles using transits or theodolites.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

8.1.A Performs calculations using trigonometric functions, law of sines, and law of cosines.
8.1.B Stakes the location of all corners of a structure using a combination of distance and radial measurements, given a set of construction drawings, a control point, and a baseline.
8.2.A Places all required grade stakes for the foundation work associated with the plan layout above.
8.3.A Measures horizontal angles using transits or theodolites.
8.3.B Measures vertical angles using transits or theodolites.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Measure elevation and construct a drawing that shows a grade cross-section at a proposed building site.
- Measure the elevation of an existing structure relative to a control point.
- Given a foundation plan, a control point, and a baseline, lay out the locations and elevations of all corners, using distance and radial techniques.

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, Secretary's Commission on Achieving Necessary Skills (SCANS), SkillsUSA-VICA, Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency, United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

STANDARD 9.0

Students will complete exterior finish work on residential and commercial structures.

LEARNING EXPECTATIONS

The student will:

9.1 Use equipment and procedures to mitigate hazards unique to exterior finish work.
9.2 Continually assess wind and weather conditions, as they affect the safety of worker, and mitigate risks where possible.
9.3 Correctly install flashing and other waterproofing components, as detailed in construction drawings and specifications.
9.4 Correctly install selected common cortices.
9.5 Correctly install selected common wood sidings.
9.6 Correctly install selected manufactured product sidings.
9.7 Correctly install selected types of gutters and downspouts.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

9.1.A Assesses the danger of slipping on ladder and scaffolding surfaces.
9.1.B Verifies the security of ladders and scaffolding before climbing on them.
9.1.C Inspects and uses safety equipment that is in good condition.
9.2.A Assesses the wind hazard when handling large sheet goods and uses advantageous handling procedures.
9.2.B Assesses the dangers from approaching thunderstorms and other storms, and takes necessary precautions to avoid risks.
9.2.C Protects self from exposure to weather-related hazards, such as sunburn and wind chill.
9.3.A Installs flashing around windows and exterior doors.
9.3.B Applies caulking, as needed or as specified, with windows and doors.
9.4.A Selects appropriate types of cornices and estimates quantities required for a given job.
9.4.B Installs selected cornices for a given job.
9.5.A Selects appropriate types of wood siding and estimates quantities required for a given job.
9.5.B Installs selected wood sidings for a given job.
9.6.A Selects appropriate types of manufactured product sidings and estimates quantities required for a given job.
9.6.B Installs selected manufactured product sidings for a given job.
9.7.A Selects appropriate types of gutters and downspouts and estimates quantities required for a given job.
9.7.B Installs selected gutters and downspouts for a given job.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- After a field trip to observe exterior finish work in progress, students write a report explaining the potential hazards observed, or the hazards that might arise, as a result of inclement weather.

- Design and fabricate an exterior finish system, for example, a 4-foot wide model, including sheathing, siding, vapor barrier, flashing, cornice, and gutter.
- Return to previously installed windows and doors projects and complete the installation of appropriate exterior finish items.

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, Secretary's Commission on Achieving Necessary Skills (SCANS), SkillsUSA-VICA, Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency, United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

STANDARD 10.0

Students will describe the need for and methods of achieving thermal and moisture protection.

LEARNING EXPECTATIONS

The student will:

10.1 Calculate R-values for specified wall designs.
10.2 Describe the need for and typical methods for implementing attic ventilation.
10.3 Describe the need for and typical methods for providing vapor barriers on floors, walls, ceilings, and roofs.
10.4 Install insulation, vapor barriers, and house wraps.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

10.1.A Compares and contrasts the R-values for various insulation material and wall designs.
10.2.A Describes the consequences to a structure of an inadequately ventilated attic.
10.2.B Explains how soffit vents, baffles, gable, roof, and ridge vents are used in combination to provide ventilation.
10.3.A Describes the consequences to a structure of an ineffective vapor barrier.
10.3.B Explains choices of vapor barrier to foundation slabs.
10.3.C Explains choices of vapor barrier to walls, ceilings, and roofs.
10.4.A Include and install insulation, vapor barriers, and house wraps on mock-ups of exterior wall sections, as required by construction drawings and specifications.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Include insulation, vapor barrier, and house wrap materials in the design and fabrication of an exterior finish system from a previous project.
- Using the construction drawings of a residential or commercial structure, examine the cross-sectional wall details, calculate the cumulative R-value, and find the percent contribution of each component of the wall to the total R-value.

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, Secretary's Commission on Achieving Necessary Skills (SCANS), SkillsUSA-VICA, Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency, United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

STANDARD 11.0

Students will perform basic oxyfuel cutting and shielded metal arc welding on carbon steel.

LEARNING EXPECTATIONS

The student will:

11.1 Store, operate, and maintain welding equipment and accessories according to accepted industry practice.
11.2 Perform oxyfuel cutting operations.
11.3 Make single-and multiple-pass fillet and groove welds using a shielded, metal arc welding (SMAW) process.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

11.1.A Exhibits acceptable dress and personal grooming as identified by the welding industry.
11.1.B Demonstrates the correct use of basic metal working and welding equipment.
11.1.C Correctly uses adequate ventilation during welding and cutting operations.
11.1.D Complies with equipment manufacturers recommended maintenance procedures.
11.2.A Produces parts involving manual straight cuts using the oxyfuel gas-cutting process
11.2.B Produces parts involving manual shaped cuts using the oxyfuel gas-cutting process.
11.2.C Produces parts involving manual beveled cuts using the oxyfuel gas-cutting process.
11.2.D Correctly uses weld-washing techniques.
11.3.A Correctly makes single-and multiple-pass fillet and groove welds in the flat position.
11.3.B Correctly makes single-and multiple-pass fillet and groove welds in the horizontal position.
11.3.C Correctly makes single-and multiple-pass fillet and groove in the vertical position.
11.3.D Correctly makes single-and multiple-pass fillet and groove welds in the overhead position.

SAMPLE PERFORMANCE TASKS

These are sample projects of the type and scale recommended to address one or more of the learning expectations for this standard. Other projects can be used at the instructor's discretion.

- Demonstrate proper use of protective equipment, hoods, leathers, and clothing.
- Using oxyfuel flame cutting equipment, cut metal plate parts for the assembly of a Z-shaped bracket, including four bolt-holes.
- Weld bridge bracing to real or simulated bar joist.

INTEGRATION/LINKAGES

Science, Computer Skills, Research and Writing Skills, Language Arts, Communication Skills, Leadership Skills, Teamwork Skills, Applied Communication, Secretary's Commission on Achieving Necessary Skills (SCANS), SkillsUSA-VICA, Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency, United States Department of Labor, Tennessee Department of Labor and Workforce Development

CARPENTRY II

SAMPLING OF AVAILABLE RESOURCES

- National Center for Construction Education and Research (NCCER), *Core Curriculum*. Prentice Hall, Upper Saddle River, NJ; ©2000. Also known as the "Wheels of Learning" materials.
- National Center for Construction Education and Research (NCCER), *Carpentry Level One*. Prentice Hall, Upper Saddle River, NJ; ©2001. Also known as the "Wheels of Learning" materials.
- National Center for Construction Education and Research (NCCER), *Carpentry Level Two*. Prentice Hall, Upper Saddle River, NJ; ©1999. Also known as the "Wheels of Learning" materials.
- National Center for Construction Education and Research (NCCER), *Carpentry Level Three*. Prentice Hall, Upper Saddle River, NJ; ©1999. Also known as the "Wheels of Learning" materials.
- National Center for Construction Education and Research (NCCER), *Carpentry Level Four*. Prentice Hall, Upper Saddle River, NJ; ©1999. Also known as the "Wheels of Learning" materials.